

Claims

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1. A data communications cable comprising:  
a first twisted pair of insulated conductors;  
a second twisted pair of insulated conductors;  
5 a dielectric pair separator consisting of a dielectric layer disposed between the first twisted pair and the second twisted pair of insulated conductors, the dielectric pair separator being folded and arranged to provide a plurality of grooves extending along a longitudinal length of the data communications cable, the dielectric pair separator providing a sufficient spacing between the first twisted pair of insulated conductors and  
10 the second twisted pair of insulated conductors so as to provide a desired crosstalk isolation between the first twisted pair of insulated conductors and the second twisted pair of insulated conductors;  
a jacket assembly enclosing the first twisted pair of insulated conductors, the second twisted pair of insulated conductors and the dielectric pair separator; and  
15 wherein the plurality of grooves do not form completely enclosed channels.
2. The data communications cable according to claim 1, wherein the dielectric pair separator is made of a foamed polymer.
- 20 3. The data communications cable according to claim 1, wherein the dielectric pair separator is a woven fiberglass tape.
4. The data communications cable according to claim 1, wherein the dielectric pair separator is a flame-retardant, low-dielectric constant, foamed polymer tape.
- 25 5. The data communications cable according to claim 1, wherein the dielectric pair separator is a foamed fluorinated ethylene propylene material material.
6. The data communications cable according to claim 1, further comprising a central  
30 core filling material disposed in a core of the data communications cable between the first and second twisted pairs of insulated conductors.
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7. The data communications cable according to claim 6, wherein the central core filling is made of a same material as the dielectric pair separator.

8. The data communications cable according to claim 1, wherein the cable is  
5 substantially flat.

9. The data communications cable according to claim 1, further comprising a conductive shield surrounding the combination of the first twisted pair of insulated conductors, the second twisted pair of insulated conductors, and the dielectric pair  
10 separator.

10. A data communications cable comprising:  
a plurality of twisted pairs of insulated conductors,  
a dielectric pair separator consisting of a dielectric layer formed with a plurality  
15 of folds to provide a plurality of grooves extending along a longitudinal length of the communications cable;  
each twisted pair of insulated conductors of the plurality of twisted pairs of insulated conductors, being disposed within a corresponding groove of the dielectric pair separator;  
20 a jacket assembly enclosing the plurality of the twisted pairs of insulated conductors and the dielectric pair separator; and  
wherein the plurality of grooves do not form completely enclosed channels.

11. The data communications cable according to claim 10, wherein the dielectric pair  
25 separator is folded so as to separate each twisted pair of insulated conductors from every other twisted pair of insulated conductors, with a sufficient spacing to provide a desired crosstalk isolation between each of the plurality of twisted pairs of insulated conductors.

12. The data communications cable according to claim 10, wherein the dielectric pair  
30 separator is wrapped around a first twisted pair of insulated conductors of the plurality of twisted pairs of insulated conductors, so as to separate the first twisted pair of insulated conductors from a remainder of the plurality of twisted pairs of insulated conductors, with a sufficient spacing to provide a desired crosstalk isolation between the first twisted

pair of insulated conductors and the remainder of the twisted pair of insulated conductors.

13. The data communications cable according to claim 10, wherein the plurality of  
5 folds of the dielectric pair separator extend from a center of the data communications cable to at least a pitch radius of the data communications cable.
14. The data communications cable according to claim 10, wherein the dielectric pair separator is a flame-retardant, foamed polymer tape.
- 10 15. The data communications cable according to claim 12, wherein the dielectric pair separator is a woven fiberglass tape.
16. The data communications cable according to claim 10, wherein the dielectric pair  
15 separator is a foamed fluorinated ethylene propylene material disposed in a core of the data communications cable between the first and second twisted pairs of insulated conductors.
17. The data communications cable according to claim 10, the cable further  
20 comprising a central core filling material disposed in a core of the data communications cable between the first and second twisted pairs of insulated conductors.
18. The data communications cable according to claim 17, wherein the central core filling is made of a same material as the dielectric pair separator.
- 25 19. The data communications cable according to claim 10, wherein the data cable is substantially flat.
20. The data communications cable according to claim 10, further comprising a  
30 conductive shield surrounding the plurality of twisted pairs of insulated conductors and the dielectric pair separator.

21. The data communications cable according to claim 10, wherein the plurality of twisted pairs of insulated conductors and the dielectric pair separator are twisted together in a helical manner along the longitudinal length of the data communications cable.

5 22. The data communications cable according to claim 10, further comprising a drain wire disposed within a center of the dielectric pair separator between the plurality of folds of the dielectric pair separator, and extending along the longitudinal length of the data communications cable.

10 23. The data communications cable according to claim 10, wherein a plurality of the data communications cables are disposed within an outer casing to form an overall data cable.

15 24. A data communications cable comprising:  
a first twisted pair of insulated conductors;  
a second twisted pair of insulated conductors;  
a dielectric pair separator consisting of a dielectric layer and a conductive layer disposed between the first twisted pair and the second twisted pair of insulated conductors, the dielectric pair separator being folded and arranged to provide a plurality of grooves extending along a longitudinal length of the data communications cable, the dielectric pair separator providing a sufficient spacing between the first twisted pair of insulated conductors and the second twisted pair of insulated conductors so as to provide a desired crosstalk isolation between the first twisted pair of insulated conductors and the second twisted pair of insulated conductors;  
20 a jacket assembly enclosing the first twisted pair of insulated conductors, the second twisted pair of insulated conductors and the dielectric pair separator; and wherein the plurality of grooves do not form completely enclosed channels.

25 25. The data communications cable according to claim 24, wherein the dielectric pair separator is folded and arranged so that the conductive layer faces each of the first twisted pair of insulated conductors and the second twisted pair of insulated conductors, and further comprising a binder wrapped around the first twisted pair of conductors and the second twisted pair of conductors, the binder having a  
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conductive layer facing each of the first twisted pair of insulated conductors and the second twisted pair of insulated conductors, so that the binder and the dielectric pair separator in combination form enclosed channels that provide increased crosstalk isolation and reduced susceptibility to electromagnetic interference.

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26. A data communications cable comprising:

a plurality of twisted pairs of insulated conductors;

a dielectric pair separator consisting of a dielectric layer and a conductive layer

10 formed with a plurality of folds to provide a plurality of grooves extending along a longitudinal length of the data communications cable;

a jacket assembly enclosing the first twisted pair of insulated conductors, the second twisted pair of insulated conductors and the dielectric pair separator;

15 each twisted pair of insulated conductors of the plurality of twisted pairs of insulated conductors being disposed within a corresponding groove of the dielectric pair separator;

20 a binder enclosing the plurality of twisted pairs of insulated conductors and the dielectric pair separator, the binder having a conductive layer that faces each of the plurality of twisted pairs of insulated conductors so that the binder in combination with the dielectric pair separator provides a plurality of enclosed channels extending along a longitudinal length of the data communications cable, each enclosed channel providing crosstalk isolation between the corresponding twisted pair of insulated conductors enclosed within the channel and the remainder of the plurality of twisted pairs of insulated conductors, and providing reduced susceptibility of the twisted pair of insulated  
25 conductors to electromagnetic interference; and

wherein the plurality of grooves do not form completely enclosed channels.

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27. The data communications cable according to claim 26, wherein the dielectric pair separator is folded and arranged so that the conductive layer faces each of the plurality  
30 of twisted pairs of insulated conductors.

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28. The data communications cable according to claim 27, further comprising a binder enclosing the plurality of twisted pairs of insulated conductors and the dielectric

pair separator, the binder having a conductive layer that faces each of the plurality of twisted pairs of insulated conductors so that the binder in combination with the dielectric pair separator provides a plurality of enclosed channels extending along a longitudinal length of the data communications cable, each enclosed channel providing crosstalk  
5 isolation between the corresponding twisted pair of insulated conductors enclosed within the channel and the remainder of the plurality of twisted pairs of insulated conductors, and providing reduced susceptibility of the twisted pair of insulated conductors to electromagnetic interference.

10 29. The data communications cable according to claim 28, wherein the binder and the dielectric pair separator are made of an aluminum/mylar tape, the aluminum layer of the tape being the conductive layer facing the plurality of twisted pairs of insulated conductors.

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